LSI Docket No.: 99-284

REMARKS

Claims 1-15 were originally filed and remain pending. In the Office Action mailed 8 September 2003, the Examiner objected to figure 5 and rejected all claims 1-15. Claims 1-7, 14 and 15 were rejected under 35 U.S.C. §112, second paragraph. Claims 1, 2, 5-7 and 13 were rejected under 35 U.S.C. §102(e) as anticipated by Nguyen et al. (United States Patent Application Number 2002/0004883 filed October 20, 1999). Claims 1, 2, 5-8 and 11-13 were rejected under 35 U.S.C. §102(e) as anticipated by Ito et al. (United States Patent Number 6,408,359 filed November 8, 1999). Claims 1, 2, 5-7 and 13 were rejected under 35 U.S.C. §103(a) as unpatentable over Nguyen. Claims 3, 4, 9, 10, 14 and 15 were rejected under 35 U.S.C. §103(a) as unpatentable over Ito et al. in view of D'Errico et al. (United States Patent Number 6,314,503 filed December 30, 1998).

OBJECTION TO THE DRAWINGS

The Examiner objected to the drawings because the specification refers to an element 186 not shown in figure 5. A proposed correction has been provided with the change marked. The method/procedure is erroneously labeled as 188 rather than the proper reference 186. The correction changes the reference number 188 to the intended 186. Corrected formal drawings will be submitted in due course in the prosecution of the subject application.

Applicants thank the Examiner for the careful review of the application and respectfully request reconsideration and withdrawal of the objection to the drawings.

35 USC §112 REJECTIONS

The Examiner rejected claims 1-7, 14 and 15 under 35 U.S.C. §112, second paragraph for various issues.

The Examiner suggests that claim 1, lines 16-7 (as filed) is unclear (the step of forming volume information). Applicants have amended claim 1 to delete the

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objectionable term. The step as amended clarifies the recitation by broadening it to simply recite volume information without attempting to narrow what the volume information must contain. The noted limitation now simply recites "forming volume information describing the logical data volume".

As per claim 4, the Examiner suggests that the phrase "migrating at least a portion of the one of the storage spaces" is ambiguous and open to multiple interpretations. The Examiner suggests it is unclear whether migration means moving data or simply re-allocating storage space not yet written to. The Examiner suggests the latter interpretation was applied in examination.

Applicants respectfully submit that "migrating" is well understood by those skilled in the art as a step that moves data (if any) from one location to another location. Such a definition is widely accepted in the storage arts and, more specifically, is clearly recited in the specification both at page 8, lines 8-11 and on page 13, line 18 through page 14, line 2. The amount of data to be moved in such a migration may be small or even zero if little or no data has yet been written to the portion of the volume being migrated. None the less, the interpretation of "migrating" should be understood to encompass moving the data of a portion of the volume from one location to another location (regardless of how much, if any, data actually need be moved).

The Examiner also suggests that claim 14 is unclear as to what element "contains" the "plurality of storage arrays". The Examiner correctly interpreted the offending phrase as indicating that the CSA contains the plurality of storage arrays. Claim 14 has been amended to clarify this intended interpretation.

The Examiner lastly suggests that claims 14 and 15 are unclear with respect to the recitation of "data transfer performance". The Examiner suggests that the phrase may refer to transfer bandwidth or space related performance requirements and suggests that the latter interpretation is used in examination.

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Applicants respectfully submit that the phrase is precisely intended to refer to either bandwidth performance parameters, or space related performance parameters, or any other performance parameter that may be defined by the host supplied performance criteria. "Performance parameters" are defined in the specification. Page 12, lines 9-13 make clear that the CSA monitors performance according to "parameters that were provided to the volume creation software 130..." Page 9, lines 5-8 make clear that the user specifies the performance parameters and supplies a non-exclusive list of examples as "size, bandwidth, etc." To help clarify this broader understanding, Applicants have amended claims 14 and 15 to recite "performance parameters" – to clarify the meaning in accordance with the cited portions of the specification.

Though not specifically recited in the Office Action, Applicants presume that claims 2-3 and 5-7 were rejected under §112 as dependent from the rejected claims 1 and 4.

In view of the above discussion and amendments, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-7, 14 and 15 under 35 U.S.C. §112.

35 USC §102 AND §103 REJECTIONS

The Examiner rejected independent claims 1, 8, 13 and 14 variously as noted above under 35 U.S.C. §102 and §103. None of the prior art of record, considered alone or in any combination, teaches or reasonably suggests a features in the independent claims as amended. Specifically, none of the art of record teaches or reasonably suggest that the storage arrays of the CSA, per se, perform the recited steps. In other words, various steps of method claims 1, 13 and 14 (to configure, monitor, reconfigure, etc, the CSA based on user supplied performance criteria) are perfumed ***by the storage arrays themselves.*** Further, any of the storage controllers may perform the various steps. One storage array (any one of the plurality) is designated as the primary device and performs these various steps. Any of the storage arrays may assume the responsibility as the primary device upon sensing failure of the present primary device.

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System claim 8 includes similar structural aspects such that the CSA primary device is a designated on of any of the plurality of storage arrays.

These distinctions over the prior art of record (all art of record considered alone or in any combination) are now more clearly recited in the claims as amended. Specifically, independent claims 1, 8, 13 and 14 all include recitations indicating that the primary device (a storage array) performs the various recited operations and functions and that any of the plurality of storage arrays may assume the role of the primary device in the CSA. This feature of the claimed invention is neither taught nor reasonably suggested by any of the art of record (considered alone or in any combination).

Applicants maintain that independent claims 1, 8, 13 and 14 are therefore distinguished over all art of record and are therefore allowable.

Dependent claims (2-7, 9-12 and 15) were similarly rejected variously under §§102 and 103. For at least similar reasons as above and as dependent upon allowable base claims, all dependent claims (2-7, 9-12 and 15) are distinguished from the art of record, considered alone or in any combination, and urged to be allowable.

in view of the above discussion and the amended claims, Applicants respectfully request reconsideration and withdrawal of the rejection of all claims variously under 35 U.S.C. §§102 and 103.

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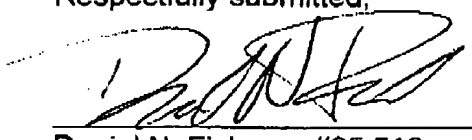
CONCLUSION

In response to the non-final Office Action mailed 8 September 2003, Applicants hereby submit this amendment, which addresses each of the Examiner's concerns. Applicants have amended various claims to overcome the rejections thereto and to better protect the invention. Applicants also submit a proposed modification to figure 5 to overcome the Examiner's objection thereto. Applicants therefore request reconsideration and withdrawal of the outstanding rejections and objections.

If any fees are deemed necessary in connection with this amendment, the Examiner is authorized to charge deposit account number 12-2252.

Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

Respectfully submitted,



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Appl No. 09/732,003
Amdt. Dated 01/08/2004
Reply to Office Action of 09/08/2003
Annotated Marked-Up Drawing

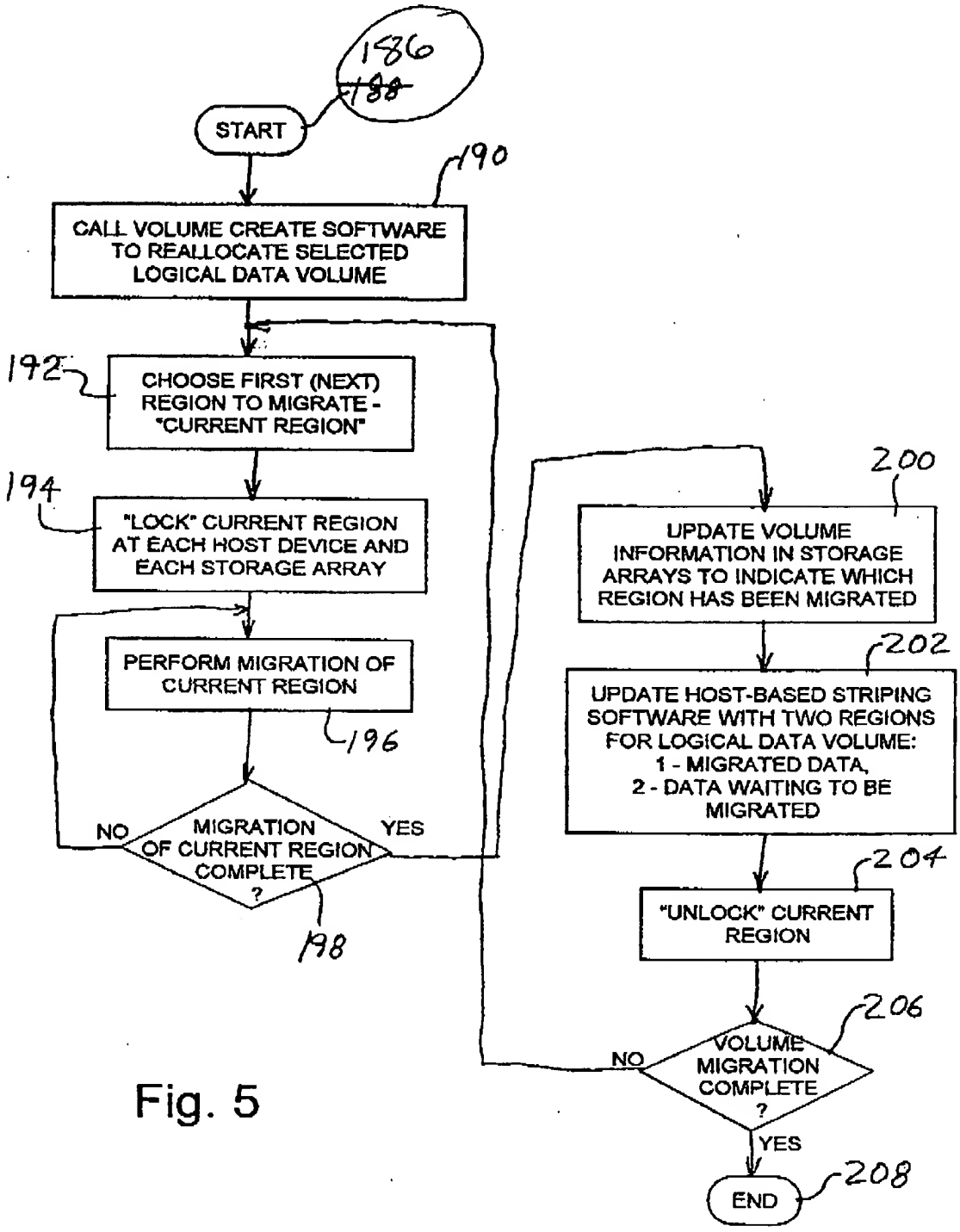

Fig. 5